# 2014 Annual Water Quality Report

**Stanford University Utilities Services**

**June 2015**

## High Quality Water

Stanford Utilities Services is pleased to provide you with the 2014 Annual Water Quality Report. The San Francisco Public Utilities Commission (SFPUC) and Stanford Utilities Services monitored water quality for both source and treated water supplies during 2014, and **in all cases the water quality was in compliance** with the State Water Resources Control Board (SWRCB) - Division of Drinking Water, and the United States Environmental Protection Agency (USEPA) drinking water requirements. We continue our commitment to provide our customers with safe, high quality drinking water. It is the policy of Stanford Utilities Services to fully inform its consumers about the water quality standards and typical concentrations. Stanford's water supply is both chloraminated and fluoridated by the SFPUC.

The SFPUC collects daily water quality samples from various locations within their transmission system. The samples are analyzed for primary standards that apply to the protection of public health and secondary standards that refer to the aesthetic qualities of water, such as taste and odor.

Stanford also routinely collects water quality samples from various locations within the campus distribution system. The most frequently collected samples are analyzed for coliform bacteria, chloramine residual, and general physical parameters. Additional water quality samples are collected to monitor for more constituents in compliance with applicable requirements. A California certified laboratory analyzes required samples. Stanford submits monthly reports to the SWRCB that include monitoring results.

## Stanford Utilities - Water Services

*Stanford Utilities Services manages the storage, distribution, maintenance, and monitoring programs for Stanford's drinking water supply. Utilities Services also maintains flushing, cross-connection, and backflow prevention programs to ensure a consistent high quality drinking water supply.*

## In This Report



***http://lbre.stanford.edu/sem/Environmental_WaterEfficiency***

# Stanford University's Drinking Water Sources

Water supplied to Stanford by the SFPUC comes from three major sources: the Hetch Hetchy watershed, the Alameda watershed, and the San Mateo watershed (all of which span the SFPUC water system shown in the map below).

### Hetch Hetchy Watershed

The Hetch Hetchy Reservoir is the largest reservoir in the SFPUC system, it is located in Yosemite National Park. In 2014, the Hetch Hetchy watershed provided the majority of the total water supply, with the remainder contributed by the two local watersheds. For the SFPUC system, the majority of source water originates from Spring snowmelt flowing down the Tuolumne River to the Hetch Hetchy Reservoir, where it is stored. This pristine Sierra water source meets all federal and state criteria for watershed protection. The SFPUC also maintains stringent disinfection treatment practices, extensive bacteriological quality monitoring, and high operational standards. As a result, the SWRCB and USEPA have granted the Hetch Hetchy water source a filtration exemption. This exemption is contingent upon the Hetch Hetchy water quality continuing to meet all filtration avoidance criteria.

### Alameda Watershed

The Alameda watershed spans more than 35,000 acres in Alameda and Santa Clara Counties. Surface water from rainfall and runoff is collected in the Calaveras and San Antonio Reservoirs. Prior to distribution, water from the watershed is treated at the Sunol Valley Water Treatment Plant.

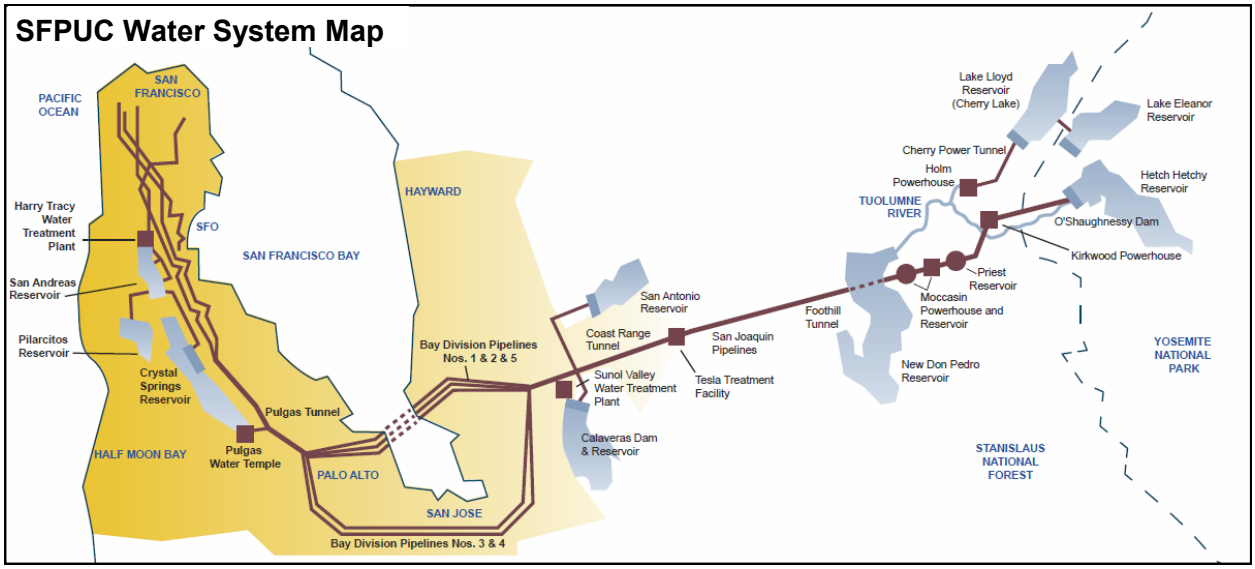
### San Mateo Watershed

Surface water from rainfall and runoff captured in the 23,000 acre Peninsula watershed, located in San Mateo County, is stored in reservoirs, including Crystal Springs (Lower and Upper), San Andreas, and Pilarcitos. The water from these reservoirs is treated at the Harry Tracy Water Treatment Plant.

### Watershed Protection

The SFPUC actively protects the water resources entrusted to its care. The Hetch Hetchy watershed is surveyed annually to evaluate the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities conducted by the SFPUC and its partner agencies (including National Park Service and US Forest Service). Once every five years the local watersheds and the approved standby water sources in the Early Intake watershed, which includes Cherry Lake and Lake Eleanor, are surveyed. The latest five year survey was completed in 2011, for the period of 2006 - 2010. These surveys identified wildlife, stock, and human activities as potential contamination sources. The reports are available for review at the San Francisco District office of SWRCB (510) 620-3474.

**SFPUC Water System Map**



# Contaminants in Drinking Water

Drinking water (including bottled water) may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800) 426-4791.

In order to ensure that tap water is safe to drink, the USEPA and SWRCB prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. SWRCB regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, which in some cases are radioactive. It can also pick up substances resulting from the presence of animals or from human activities. Such substances are called contaminants. Contaminants that may be present in source water include:

**Inorganic Contaminants,** such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharge, oil and gas production, mining, or farming.

**Radioactive Contaminants** can be naturally occurring or the result of oil and gas production, and mining activities.

**Pesticides and Herbicides** may originate from a variety of sources, such as agricultural or urban stormwater runoff and residential uses.

**Organic Contaminants** include synthetic and volatile organic compounds, that are by-products of industrial processes and petroleum production. They can also come from gas stations, urban stormwater runoff, agricultural applications, and septic systems.

**Microbiological Contaminants,** such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural live stock operations, and wildlife.

**Cryptosporidium** is a parasitic microbe found in most surface water.

The SFPUC tests regularly for this water-borne pathogen, and found it at very low levels in source water and treated water in 2014. Current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* will cause disease only if ingested. Additionally, it may be spread through means other than drinking water.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA and Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline (800) 426-4791 or Website at *www.epa.gov/safewater*.

**Lead** in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead levels in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800) 426-4791, or at *www.epa.gov/safewater/lead*.

# Important Definitions

The Water Quality Data table (Page 5) summarizes the 2014 detected drinking water contaminants and the information about their typical sources. An extensive water sample collection and testing protocol is used at the various water sources throughout the SFPUC transmission system and in the campus distribution system. In accordance with SWRCB guidance, contaminants below detection limits are not shown. The following are definitions of key terms noted on the adjacent Water Quality Data Table. These terms refer to the standards and goals for water quality.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs (see definitions below) as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

**Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

**Public Health Goal (PHG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

**Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

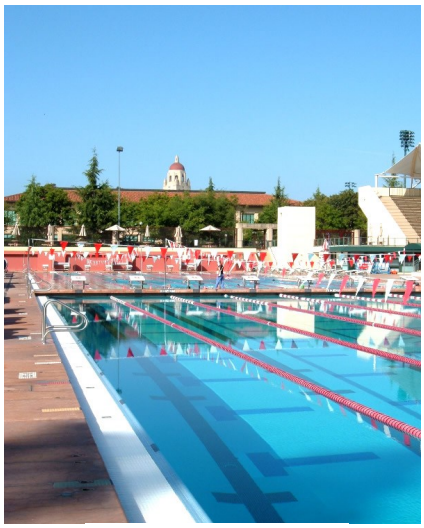
**Primary Drinking Water Standard (PDWS):** MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

**Regulatory Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**Treatment Techniques (TT):** A required process intended to reduce the level of a contaminant in drinking water.

**Turbidity:** A water clarity indicator that is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

**Diverse Uses of Campus Domestic Water**



**Swimming Pools**


**Drinking Fountains**

**Laboratories**

# Water Quality Data

## Stanford University's Annual Water Quality Data for 2014 [1]

### DETECTED CONTAMINANTS

| CONSTITUENTS WITH PRIMARY STANDARDS | Unit | MCL | PHG or (MCLG) | Range | Average or (Maximum) | Typical Sources in Drinking Water |
|---|---|---|---|---|---|---|
| **TURBIDITY (SFPUC samples)** | | | | | | |
| Unfiltered Hetch Hetchy Water | NTU | 5 | N/A | 0.2 - 0.6 [2] | (2.8) | Soil runoff |
| Filtered Water - Sunol Valley Water Treatment Plant (SVWTP) | NTU | 1 [3] | N/A | - | (0.98) | Soil runoff |
| Minimum 95 % of samples ≤ 0.3 NTU [3] | - | - | N/A | 97% - 100% | - | Soil runoff |
| **DISINFECTION BY-PRODUCTS** | | | | | | |
| Total Trihalomethanes (TTHMs) (Stanford samples) | ppb | 80 | N/A | 25.6 - 46.8 | (37.7) [4] | By-product of drinking water disinfection |
| Total Haloacetic Acids (HAAs) (Stanford samples) | ppb | 60 | N/A | 15.8 - 39.7 | (29.3) [4] | By-product of drinking water disinfection |
| Total Organic Carbon (TOC)[5] (SFPUC samples) | ppm | TT | N/A | 1.3 - 2.8 | 1.9 | Various natural and man-made sources |
| **MICROBIOLOGICAL CONTAMINANTS** | | | | | | |
| Total Coliform (Stanford samples) percentage of positives detected in any month | % | ≤5 | (0) | - | (0) | Naturally present in the environment |
| Giardia Lamblia (SFPUC samples) | cyst/L | TT | (0) | <0.01 - 0.04 | <0.01 | Naturally present in the environment |
| **INORGANIC CONTAMINANTS** | | | | | | |
| Fluoride (source water) [6] (SFPUC samples) | ppm | 2.0 | 1.0 | ND - 0.8 | 0.4 [7] | Erosion of natural deposits |
| Total Chlorine/Chloramine (Stanford samples) | ppm | MRDL=4 | MRDLG=4 | 1.2 - 2.9 | (2.3) [8] | Water disinfectant added for treatment |

| CONSTITUENTS WITH SECONDARY STANDARDS (SFPUC samples, except Color) | Unit | SMCL | PHG | Range | Average | Typical Sources in Drinking Water |
|---|---|---|---|---|---|---|
| Chloride | ppm | 500 | N/A | <3 - 15 | 9 | Runoff / leaching from natural deposits |
| Color (Stanford samples) | unit | 15 | N/A | <3 - 8 | <3 | Naturally occurring organic materials |
| Odor Threshold | TON | 3 | NA | ND - 1 | ND | Naturally occurring organic materials |
| Specific Conductance | µS/cm | 1600 | N/A | 32 - 222 | 151 | Substances that form ions when in water |
| Sulfate | ppm | 500 | N/A | 0.9 - 32 | 17 | Runoff / leaching from natural deposits |
| Total Dissolved Solids | ppm | 1000 | N/A | 31 - 120 | 81 | Runoff / leaching from natural deposits |
| Turbidity | NTU | 5 | N/A | 0.1 - 0.2 | 0.1 | Soil runoff |

| LEAD AND COPPER (Stanford Samples, 55 samples collected) | Unit | AL | PHG | Range | 90th Percentile | Typical Sources in Drinking Water |
|---|---|---|---|---|---|---|
| Copper | ppb | 1300 | 300 | <50 - 100 | 73 [9] | Corrosion of household plumbing systems |
| Lead | ppb | 15 | 0.2 | <5 - 10 | <5 [9] | Corrosion of household plumbing systems |

| OTHER WATER QUALITY PARAMETERS (SFPUC Samples) | Unit | ORL | Range | Average |
|---|---|---|---|---|
| Alkalinity (as $CaCO_3$) | ppm | N/A | 8 - 94 | 37 |
| Calcium (as Ca) | ppm | N/A | 3 - 20 | 11 |
| Chlorate [10] | ppb | 800 (NL) | 34 - 740 | 314 |
| Hardness (as $CaCO_3$) | ppm | N/A | 7 - 77 | 46 |
| Magnesium | ppm | N/A | <0.2 - 6.4 | 3.9 |
| pH | unit | N/A | 6.9 - 10.2 | 9.3 |
| Potassium | ppm | N/A | 0.2 - 1 | 0.6 |
| Silica | ppm | N/A | 2 - 5 | 4 |
| Sodium | ppm | N/A | 2.4 - 16 | 10 |

**Key:**

| | | |
|---|---|---|
| </≤ | = | less than / less than equal to |
| AL | = | Action Level |
| cyst/L | = | cyst per liter |
| N/A | = | Not Applicable |
| ND | = | Non-detect |
| NL | = | Notification Level |
| NTU | = | Nephelometric Turbidity Unit |
| ORL | = | Other Regulatory Level |
| ppb | = | parts per billion |
| ppm | = | parts per million |
| TT | = | Treatment Technique |
| TON | = | Threshold Odor Number |
| µS/cm | = | microSiemens / centimeter |

Footnotes:

1. All results met State and Federal drinking water health standards, only detected contaminants shown.
2. Turbidity is measured every four hours.
3. There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems.
4. This is the highest locational running annual average.
5. Total organic carbon is a precursor for disinfection by-product formation. The TT requirement applies to the filtered water from the SVWTP only.
6. The SWRCB specifies the fluoride level in the treated water be maintained within a range of 0.8 ppm - 1.5 ppm. In 2014, the range and average of the fluoride levels were 0.6 ppm - 1.2 ppm and 0.9 ppm, respectively. In May 2015, the target fluoride level in treated water was changed to 0.7 ppm (see Page 6).
7. The natural fluoride level in the Hetch Hetchy supply was ND.
8. This is the highest running annual average value.
9. The most recent lead and copper monitoring was in 2012. All results for samples collected at consumer taps were below the lead and copper Action Levels. Customer tap sampling is required again in 2015.
10. The detected chlorate in treated water is a degradation by-product of sodium hypochlorite, used by the SFPUC for water disinfection.

# Additional Information about Water for Residents

### Fluoridation and Dental Fluorosis

Mandated by California State law, fluoridation in water is widely accepted and has been proven to be safe and effective for preventing and controlling tooth decay. The SFPUC water had been fluoridated at the optimal level of 0.9 ppm until May 2015, when the new State regulatory guidance issued a new optimal level of 0.7 ppm.

Infants fed formula mixed with water containing fluoride may have an increased chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. The CDC considers it safe to use optimally fluoridated water for preparing infant formula. To lessen the chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste, and other dental products. Contact your health provider or SWRCB if you have concerns about dental fluorosis. For more information about fluoridation in your water, visit *www.swrcb.ca.gov* or *www.cdc.gov/fluoridation*.

### Unregulated Contaminant Monitoring Rule

The third Unregulated Contaminant Monitoring Rule (UCMR3) was released by USEPA in May 2012 and is used in the consideration and development of future drinking water standards. The UCMR3 listed a total of 28 chemical contaminants and two viruses for monitoring by select water systems between 2013 and 2015. Due to the characteristics of Stanford's water system, Stanford is required to monitor for 21 of the 28 chemical constituents quarterly between July 2014 and April 2015.

Of the 21 chemical constituents monitored in 2014, only four were detected (at very low levels), as reported in the table below. The SFPUC has reported similar data from their 2013 monitoring. In the absence of identifiable industrial sources, the SFPUC has reported that these contaminants are naturally occurring in their watersheds, except chlorate. Chlorate is a disinfectant by-product and is a common contaminant found in drinking water from treatment facilities throughout the nation.

**2014 UCMR3 Sampling Results**

| Detected Contaminants (Stanford Samples) | Unit | MCL | PHG | Range | Average | Typical Sources in Drinking Water |
|---|---|---|---|---|---|---|
| Chlorate | ppb | 800 (NL) | N/A | 90 - 210 | 155 | Byproduct of drinking water disinfection |
| Chromium-6 | ppb | 10 | N/A | <0.03 - 0.04 | <0.03 | Erosion of natural deposits; industrial discharges |
| Strontium | ppb | N/A | N/A | 15 - 40 | 27 | Erosion of pipe and natural deposits |
| Vanadium | ppb | 50 (NL) | N/A | <0.2 - 0.3 | <0.2 | Erosion of pipe and natural deposits |

For definitions of water quality terms, see Page 4 of this report.

# Conservation Alert

California has entered its 4th year of extreme drought. Provost Etchemendy issued a letter dated June 15, 2015, describing Stanford's response to the drought, calling for campus water users to implement two-days per week potable water irrigation of lawns and ornamental landscaping, and to strive to reduce irrigation with non-potable water 25% below 2013 levels. The letter from Provost Etchemendy is available at: *http://lbre.stanford.edu/sem/sites/all/lbre-shared/files/sem/files/shared/Provost_Drought2015.pdf.*

If you notice a leak on Stanford University campus, please report it to the 24-Hour Urgent Maintenance line at (650) 723-2281 with the time and location.

# Water Conservation for Residents

Stanford is a long-time partner with the Santa Clara Valley Water District (SCVWD) in offering residents valuable incentives for water conservation products, programs, and educational opportunities.

**Water saving programs that are currently available to your household.** See our website for additional information at: *http://lbre.stanford.edu/sem/Water_Efficiency*.

**Water Wise House Call**
Contact the Santa Clara Valley Water District to schedule your FREE Water Wise House Call at (800) 548-1882.

A SCVWD representative will meet with you to review your home water use and identify where you can increase efficiency. They will tell you about water conservation rebate programs available for your residence.

**High Efficiency Toilet Rebate**
You can receive a rebate for replacing toilets, that have not previously received a rebate, with high efficient models . Up to three toilets per household are eligible.

**Free Water Saving Devices**
Receive FREE showerheads (*2.0 gallon per minute (gpm)*), faucet aerators for your kitchen and bathroom (*2.0* and *1.5 gpm*, respectively), shower timers and toilet leak detection tablets. Contact Erica Kudyba at (650) 736-1946 or *ekudyba@stanford.edu*.

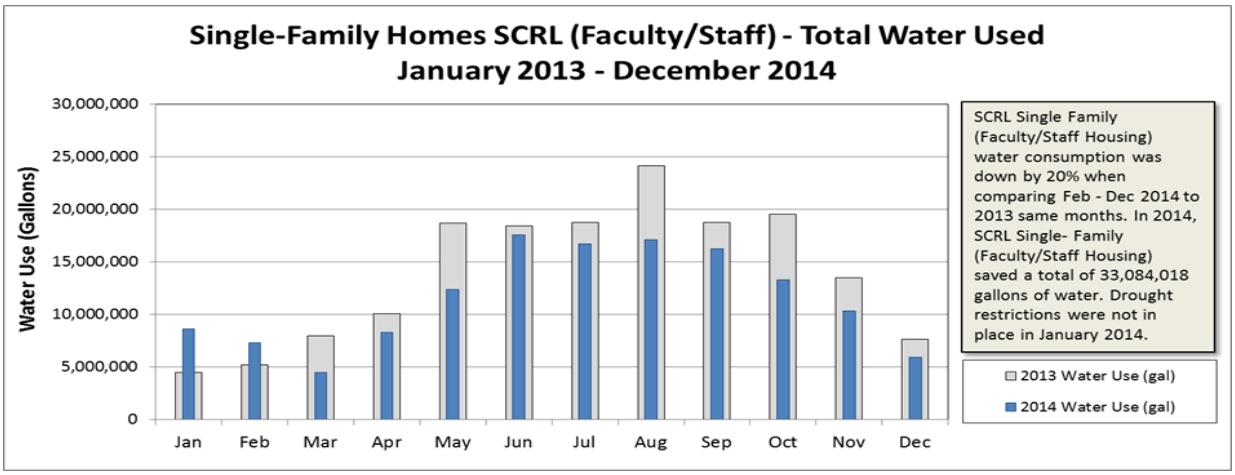
Did you know that landscape irrigation typically accounts for 70% of single-family residential household water use at Stanford?

**Landscape Rebate Program**
Replace your lawn with drought tolerant plants and receive up to $2 per square foot of lawn replaced with approved climate-appropriate plants and mulch. (You must have a Water Wise House Call completed prior to being eligible for this rebate). For more information please visit: *http://valleywater.org/Programs/LandscapeReplacementRebates.aspx*.

**Weather-Based (Smart) Irrigation Controller Pilot Study & Rebate**
Stanford's Water Efficiency Program is looking for 20 single-family campus residents to participate in a pilot study to test weather-based (smart) irrigation controller (WBIC) technology. Visit our website for more information on WBICs at: *http://lbre.stanford.edu/sem/Water_Efficiency* or contact Erica Kudyba at (650) 736-1946 to see if you qualify.

SCVWD rebates are also available for WBIC and other efficient irrigation equipment upgrades at: *http://valleywater.org/Programs/IrrigationEquipmentUpgradeRebates.aspx*.

**Faculty/Staff 2013 & 2014 Water Use**
The graph below shows faculty and staff single-family home water use for 2013 (grey) and 2014 (blue).



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# Contact Information

**USEPA Drinking Water Homepage:**
*http://www.epa.gov/safewater*
or Safe Drinking Water Hotline
(800) 426-4791

**SWRCB - Division of Drinking Water Program Homepage:**
*www.swrcb.ca.gov/drinking_water/programs/index.shtml*

**SFPUC Homepage:**
*http://sfwater.org*

**Stanford Utilities Drinking Water Homepage**:
*http://lbre.stanford.edu/sem/drinkingwater*

Este reporte contiene información muy importante sobres el agua que toma. Llame a Stanford University (650) 725-8030 sí necesita ayuda en español.

If you have questions or need additional information about this report or Stanford's water quality, please contact:

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